

**Diphtheria as a chronic malady in particular individuals : with liability in them to recrudescence / by D. Astley Gresswell.**

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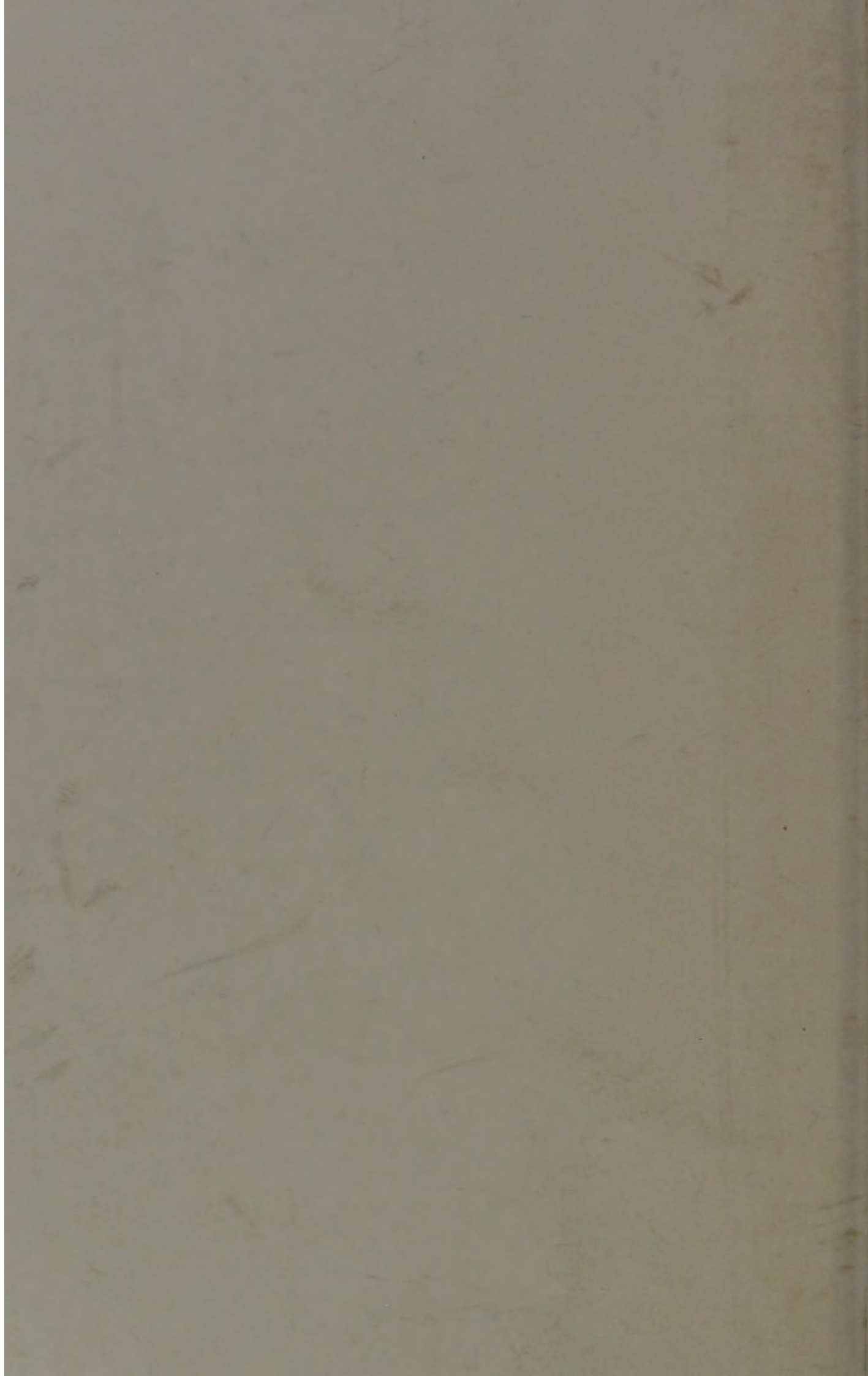
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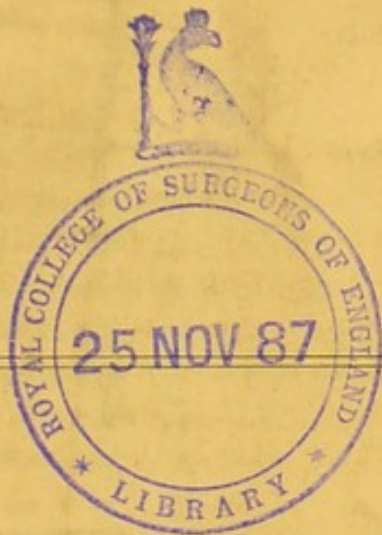
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# DIPHTHERIA

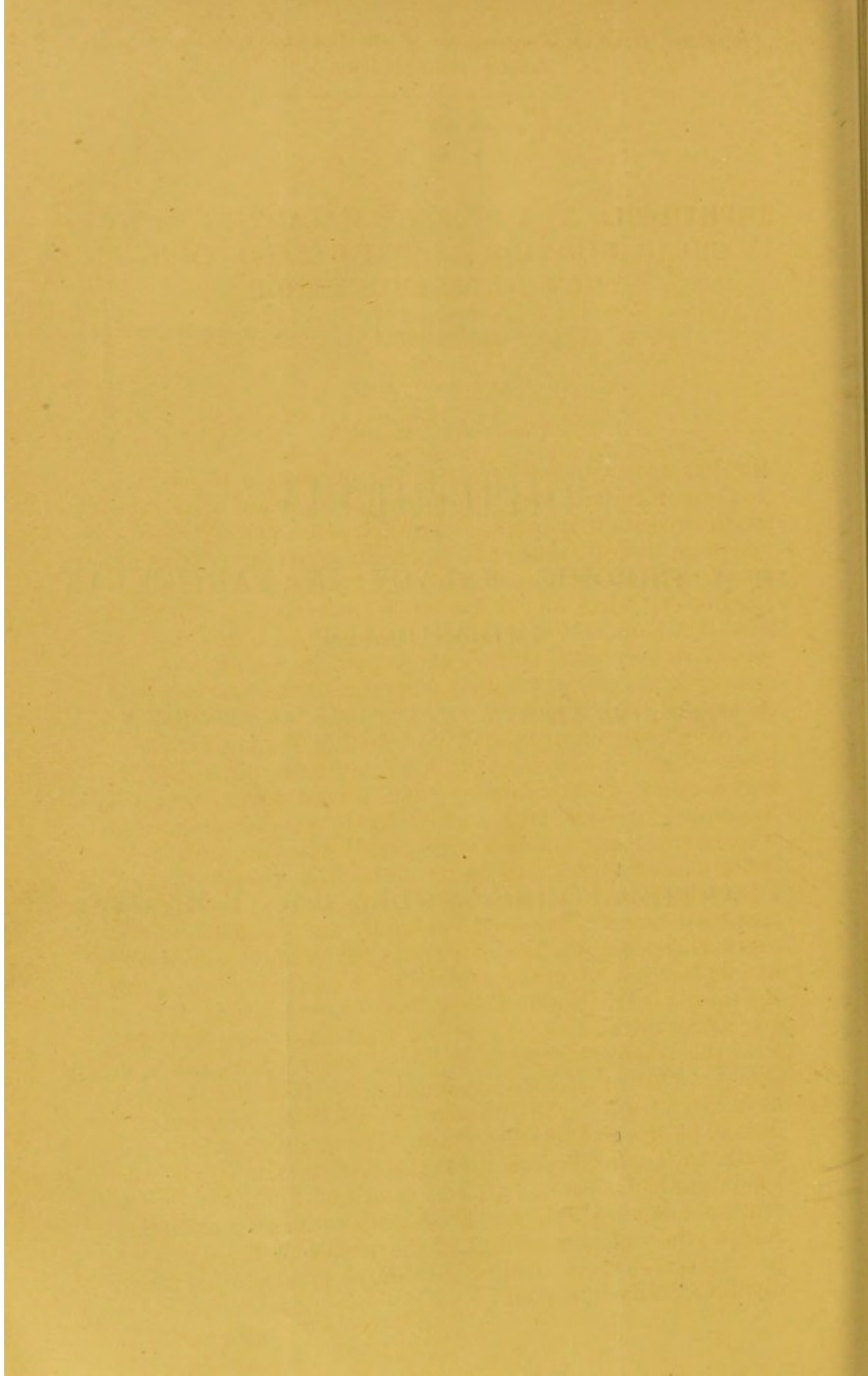
AS A CHRONIC MALADY IN PARTICULAR  
INDIVIDUALS,

*WITH LIABILITY IN THEM TO RECRUDESCENCE.*

BY

D. ASTLEY GRESSWELL, B.A., B.M., OXON.

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DIPHThERIA AS A CHRONIC MALADY IN PARTICULAR INDIVIDUALS, WITH LIABILITY IN THEM TO RECRUDESCENCE.

By D. ASTLEY GRESSWELL, B.A., B.M., OXON.

(Read: Feb. 10th, 1886.)

MR. PRESIDENT AND GENTLEMEN,—I purpose to consider in this paper certain facts which appear to show that diphtheria in certain individuals may become a chronic disease, and from time to time enter upon an active and infectious phase. Diphtheria, chronic and recrudescient, is not, I believe, admitted to exist; and it is because I have been led to think that diphtheria in these phases does exist, and that in these phases it may play an important part in maintaining the malady in a community, that I venture to address you this evening on this subject.

I have lately been engaged, on behalf of the Local Government Board, in prosecuting inquiries into diphtheria, in various parts of the country; and in the course of these inquiries I have met with a considerable number of persons who, having been affected with diphtheria years ago, have suffered almost constantly ever since from throat-affection. I have been told by persons who have suffered in this way that their throats have been habitually and peculiarly sensitive to changes of weather, very trifling exposure to wet or cold having sufficed to produce in them acute inflammation of the tonsils. Further, diphtheria has occurred among persons associating with those who at the time have been suffering from this condition; and in instances where I have not been able to find satisfactory explanation for this diphtheria, I have had to ask myself whether the condition, here referred to, may be of a diphtheritic nature. The question, put shortly, stands thus. Is the chronic tonsillar inflammation, which is left in particular persons after an attack of diphtheria, due to continued sojourn in them of the material cause of diphtheria? And do the violent reactions of the tonsils of these persons to weather changes involve likelihood of rendering them diphtheritically infectious?

I proceed to set out certain facts not inconsistent with such belief.

1. A lad, R. G., twelve years of age, fell ill of diphtheria in July, 1883. There is clear evidence that he had associated but a few days previously with a diphtheritic patient. His father, his mother, and the three others (children) of the family all fell ill of diphtheria in quick succession after him. Two of the children, aged respectively fourteen and twelve years, have suffered ever since from tonsillar trouble, and the tonsils of each have, ever since, been prone to swell largely on exposure to either cold or wet.

Late in April, 1885, a woman who had visited this family fell ill of diphtheria. I took some considerable trouble in attempting to solve the origin of her case; and the only fact that I felt worthy of consideration was that she had associated frequently, for some weeks prior to her attack, with the family referred to. She had, I learnt, become much attached to the children aged fourteen and twelve years.

The conclusion suggested itself to me that the woman contracted diphtheria, either from some member of this family, or from some infected thing in the house inhabited by this family.

The latter alternative is open; it would appear to be impossible to exclude it. But I would suggest—and I think with equal, or rather, with greater, probability of truth—that she derived infection from one or other of the children. Six days prior to her attack, I had seen these children. The child aged fourteen years at that time presented a strawberry tongue, an enlarged left tonsil, and hypertrophied pharyngeal follicles; a white, sticky substance also was adherent to various parts of the throat. The child aged twelve years had at the same date large red tonsils; the follicles were widely open, and a white substance was exuding from them. If the view which I have taken of the origin of infection in this case be correct, a person once infected with diphtheria may remain capable of transmitting infection for a period of nearly two years.

2. A girl, A. P., took diphtheria in December, 1881. This girl has, I am told, suffered ever since from sore-throat. Whenever she has been exposed to cold, especially if the feet have been wet, her tonsils have very quickly swelled, and to an extent involving, her mother has supposed, danger of suffocation. She suffered from one such attack of sore-throat in July 1883, very shortly (two weeks or so) after she had taken on duties as monitress in a school. I was not able to find any other explanation for this attack of sore-throat than the one suggested by herself and her mother;

she "had taken cold"; there was not apparent any evidence to show that she had within a recent period been in association with any person, or been in contact with any thing, infected with diphtheria.

This girl continued her duties at school for a day or two after falling ill, and within a few days—at the most, five or six—three children who were attending the school fell ill, and two of the three died, of diphtheria; while other cases and deaths occurred evidently as result of infection contracted from the three children referred to. I made searching inquiry into the previous health of the school children and school teachers, also of the persons living in the village and in the surrounding country; but I was not able to find evidence affording any probability that the three children derived their infection from any other source than the teacher, A. P.

This case suggested to me dormancy and recrudescence in an infectious form of the material cause of diphtheria in the individual.

3. A lad, J. W., nine years of age, suffered, it is said, from diphtheria late in 1877, and all the rest of the family (four in number) suffered about the same time. In 1878 he again, it is said, had diphtheria, and one of his brothers died of diphtheria. He was then two years of age. Ever since this second attack he has been subject to severe attacks of sore-throat, and "when he gets wet-shod, the tonsils quickly swell and become covered with a white coating". One morning in August, 1884, he played truant from school; he returned to school (where he boarded) late, the same night, very wet and feeling ill, and next day he was reported by his medical attendant to be suffering from diphtheria. It is possible that while truant he came into contact, or that previously he had been in contact, with diphtheria-infected persons or things. But, though I took considerable trouble to trace the movements of the boy, I was not able to discover such contact and the consideration arose as to whether mere exposure to wet had been in this lad a sufficient cause for revival of growth of the material cause of diphtheria lying dormant in him. The question may be raised whether the last attack was truly one of diphtheria. All I can say in answer is, that the medical attendant who pronounced the case to be one of diphtheria had had considerable experience of this malady; and that I have suspicion that the lad has been on several occasions, in late years, a centre for diphtheritic infection.

I quite recently met with a very similar instance in the person of a girl.



4. A family, twelve in all, with governess and four servants, living together in an isolated house, were remarkably free from illness, and no case of sore-throat, croup, laryngitis diphtheria, mumps, or scarlet-fever can be remembered to have occurred in the house for some consecutive years prior to March, 1881. Between March, 1881, and July, 1882, seven cases of diphtheria occurred among the inmates of this house.

There is good reason for thinking that diphtheria was in the first instance imported in the person of a servant girl, and that all of the seven cases above spoken of were due to infection derived directly or indirectly from her.

Most of the patients were sent away, either very shortly after their several illnesses had been recognised, or as soon as possible during convalescence; and attack in all but two instances was preceded by the return, a few days or a week or so before, of the person who had suffered last.

It may be noted that the first patient was, in the early days of her illness, said to be suffering from quinsy, and that her death, which took place six days after she had fallen ill, was registered as due to diphtheria. It may also be added that diphtheria occurred and caused deaths in several families among which these patients and convalescents had been sent.

General and careful cleansing and disinfection were conducted in and about the house on several occasions during the above-mentioned period.

Still, however, severe attacks of sore-throat continued to occur, and cases of diphtheria were recognised, viz., one in February, 1883, one in July, 1883, one in September, 1884, three in quick succession in October, 1884, one in May, 1885, and finally, the last case in June, 1885. All but one of these were primary attacks. It is quite possible that the belongings of the house had, by virtue of the succession of cases between March, 1881, and July, 1882, become so far infected that fresh occurrences of sore-throat and diphtheria may be explained on this ground. But I wish to draw attention to the fact that one of the seven who suffered between March, 1881, and July, 1882, has suffered from throat-affection ever since, and has had acute attacks of sore-throat from time to time. On one occasion, when she was suffering from an attack which she regarded as an excessive development of her ordinary attacks, she was recognised on medical authority as again suffering from diphtheria; and, ten days after this illness began, a servant, a new-comer, slept with her, and a few days later fell ill of diphtheria.

5. A girl, E. D., aged 15 years, another monitress, was

taken with diphtheria early in June, 1884, and her illness is definitely traceable to personal infection. Among the children at the school where she was teaching there occurred three cases of diphtheria in November of the same year. I was able to suggest but one explanation for these cases. This explanation lay in the fact that the monitress had a second severe attack of sore-throat early in November, when she was a second time disabled for a few days from work, and that she returned to school, still with some degree of tonsillar discomfort, only a few days before these three cases occurred. I was not able to trace any renewal of infection as a cause of her second illness.

The five groups of cases above detailed serve to illustrate what I have in view when speaking of diphtheria in certain individuals as a chronic malady with liability in them to recrudescence. To these illustrations I would add yet another.

In an asylum, in which some 150 female orphans are brought up as domestic servants, throat-affections of one and another sort (variously spoken of as putrid-throat, sore-throat, throat-affection, strumous throat, and the like) have almost constantly been present, and diphtheria has been recognised from time to time for several years past. On turning to the fragmentary records of illness in this asylum (the sick-register in which are entered only those patients actually under treatment on twenty-six days in the year—a fortnightly record, in fact)—I found the following facts recorded. A girl, then 11 years of age, was taken with diphtheria on February 23rd, 1881, and she was suffering from loss of ocular accommodation on April 8th of the same year. This girl has suffered frequently from sore-throat since this attack, and on October 7th, 1883, she and four other orphans were invalided with "sore-throat and catarrh". The precise order in which she and the other four fell ill cannot now be ascertained. Again, one of the four referred to has suffered on and off from sore-throat ever since October, 1883, to an extent, indeed, necessitating periodic removal to hospital, and quite recently she has been recognised as suffering from diphtheria. Other similar facts were recorded, suggesting a chain-like order of succession among cases of sore-throat and diphtheria.

It is, I think, at least open to question whether diphtheria has not been maintained in this asylum in the persons of its inmates, and in a way as suggested by the facts just mentioned.

In turning now to the bearings which diphtheria, chronic and recrudescient, may have upon sustained prevalence of the disease

in a community, I feel that little need be said; for, if we admit that diphtheria may in certain persons become a chronic affection, and at times re-enter upon an active phase, we admit a factor of evident importance in the causation of sustained prevalence of diphtheria.

In the course of my inquiries I have met with several persons who, while suffering from what I have spoken of as recrudescient diphtheria, have, apparently, been the starting-point for fresh infection of a large number of persons hitherto healthy, for a fresh outbreak, in fact, of the disease in a community. Acute attacks of tonsillitis sequent upon an attack of diphtheria—or, as I have supposed, attacks of recrudescient diphtheria—in monitresses have, on several occasions, appeared to be the starting-point of diphtheria among school children. Since I first thought of such interpretation for long-continued prevalence of diphtheria in a community, I have examined most, or all, of the throats of the children attending certain schools in times of epidemic prevalence of diphtheria; and I have on some of these occasions met with children who, some months after having been supposed to be convalescent from diphtheria, have at the time of my examination presented creamy patches on the tonsils and pharynx. In this connection, I may add that I have lately had my attention drawn to several patients who, after an attack of diphtheria, have been discharged from hospital with "healthy-looking tonsils", but who have returned with genuine diphtheritic patches on the throat a month or so later. It is possible that such cases are due to renewed infection; on the other hand, they may be regarded as resulting from a renewed vitality of the virus still lying there.

The facts set out above afford the chief of the inductive evidence I have at command on this subject. There is, too, some weight of deductive evidence; and I would the more readily direct attention to it, because these views have been attacked on the ground that analogy does not furnish any warrant for their truth. Syphilis is a disease which we recognise in its chronic and recrudescient phases in instances in which we have almost complete certainty that there has not been any renewed inoculation. Ague manifests a like character in its widely separated relapses—relapses absolutely independent, it is said, of fresh exposure to malaria. The relapses of relapsing fever are supposed to be due to varying phases in the life-history of the parasitic organism believed to be its cause. Glanders in the horse may become a chronic affection, and from time to time take on an active and contagious character; glanders, indeed, may, to all appearance,

have been cured, and yet manifest itself afresh months afterwards, independently of any renewed infection. Scarlet-fever may relapse, presenting all the associated phenomena of the primary attack, very early in its convalescent stage; and though I personally know of no instance in which it would be possible to exclude fresh infection as the cause of the relapse, renewed vitality of the virus in the system suggests itself to me as affording a possible interpretation. The relapses of enteric fever are frequently put down to renewed infection; it is likely enough that in this case also relapse depends upon some phase of the history of a living cause. In this connection, also, the relation of gleet to gonorrhœa appears to be of significance. The contagiousness of gleet is, I believe, generally admitted. It has, however, been so precisely formulated by Dr. Emil Noeggerath, as the result of prolonged and careful observation, that I have thought well to record a statement of his. It runs thus. "Der latente Tripper bei dem Manne, wie bei der Frau, vermag bei einem bisher gesunden Individuum entweder eine latente gonorrhœe oder die Erscheinungen des akuten Trippers hervorzurufen." Contagious ophthalmia is a case of like kind.

In thinking of the meaning of recrudescence of maladies referable to the vital activities of a parasitic organism, the following considerations may, perhaps, be borne in mind.

It has, in recent times, been abundantly shown that protoplasm low in the scale of life, equally with protoplasm high in the scale of life, protoplasm undifferentiated equally with protoplasm differentiated, is so constituted that periods of rest are conducive to its well-being, nay, are necessary conditions to the continuance of its individuality. Among the Cryptogamia and Protista, periods of rest are of such long duration that the term "rejuvenescence" has been applied to the phenomenon of an apparently renewed vitality. But this phenomenon is not confined to the organic individual. It is well known that a crystal which doubly refracts light elongates in the direction of the optic axis, and contracts in the direction at right angles to this axis when it is subjected to the influence of heat, and that after one contraction thus brought about a period of rest must elapse before the crystal will yield to the same stimulus a second response equal to the first. It is most likely that these periods of rest are largely occupied by processes of a physical nature. Muscle we know to consist largely of doubly refracting particles. May not the period of rest, essential to muscle, be essential, as in the case of the crystal, largely for physical reasons?

It may be, also, that protoplasm in its native, its undifferen-

tiated state, consists of molecules, individually as definite in shape as inorganic molecules, and that its vital activities are the sensitive response of its molecules to the wave-movements in its environment, while its periods of rest are essential largely in order that it may slowly rearrange its parts. At any rate it seems clear that the organic individual, low or high in the scale of life, needs periods of rest; and the same, too, holds, it seems, of the inorganic individual. It may be justifiable analogy to regard recrudescence of a disease which is apparently referable to the life of a parasitic organism as the expression of rejuvenescence of that organism. That some such process takes place in some diseases is scarcely to be doubted; that it takes place in diphtheria I have more than suspected.\*

I cannot bring this paper to a close without making reference to the conditions under which those persons have been living who have manifested recurring and, as I have thought, diphtheria-imparting sore-throat after having once suffered from diphtheria. The conditions have been almost without exception such as would unhesitatingly be pronounced unwholesome. The dwellings inhabited by these persons have been badly ventilated, damp and mouldy; and in some instances they have had grave defects of drainage. I have been told that such conditions are amply sufficient for the maintenance, if not for the production, of the material cause of diphtheria; and that, the conditions being as represented, there is no need to go further afield and speak of recrudescence of diphtheria in the individual. It may be so; but I think by no means necessarily so. The conditions referred to produce in particular individuals, it seems, a reduced vitality, which is largely evidenced in inco-ordinated aimless development of amœboid elements in adenoid tissue. The tonsils, with other parts of the body, suffer, and it is likely enough that in such condition they afford exceptionally suitable "hosts" for sustained maintenance of the virus of diphtheria, and under certain conditions, such as those spoken of as "chilling", for a revival of it.

I would add, by way of conclusion, that if diphtheria presents such features as I have spoken of in this paper, there is additional reason for ensuring that dwelling-houses be made wholesome; and, too, there is need of special help at the hands of the therapist.

\* It may be that protoplasm of even complex organisms may become so altered in its beat as to have a specific spermatic influence on protoplasm of the same or of other organisms. Gonorrhœa and contagious ophthalmia, in some of their manifestations, appear, indeed, to offer justification for such a speculation.



